IN THE CLAIMS

Please amend the claims to read as follows:

1.-25. (Cancelled)

26. (Currently Amended) A polymerization catalyst obtained by a process that comprises reacting:

an aluminum oxy compound(a) having a ratio of an intensity at 30 ppm(H2) to an intensity at 10 ppm(H1) [H2/H1] in an ^{27}Al-solid NMR spectrum of less than 0.35,

water(b), and

a compound(c) having a hydroxy group selected from the group consisting of tertiary alcohols and alcohols substitute with a halogen atom, the alcohols substituted with a halogen being selected from the group consisting of alcohols indicated by the formula $CR^1R^2R^3$-OH (wherein each of R^1, R^2 and R^3 independently represents a hydrogen atom or hydrocarbon group having 1 to 20 carbon atoms, which is optionally substituted with a halogen atom, and they may be mutually the same or different), halogenated phenol compounds and silanol compounds;

wherein the modified aluminum oxy compound (A) has a ratio of an intensity at 30 ppm(M2) to an intensity at 10 ppm(M1)[M2/M1] in an ^{27}Al-solid NMR spectrum of 0.60 or more, the molar ratio[(a)/(b)] of the aluminum oxy compound(a) to water(b) is 1/3 to 1/0.01, and the molar ratio [(a)/(c)] of the aluminum oxy compound(a) to the compound(c) is 1/3 to 1/0.01 ~~contacting (A) a modified aluminum oxy compound, which is an aluminum oxy compound that has been modified by reacting with a compound having a hydroxy group, wherein the modified aluminum oxy~~

~~compound has a ratio of an intensity at 30 ppm(M2) to an intensity at 10 ppm(M1) [M2/M1], in an ^{27}Al-solid NMR spectrum of 0.60 or more,~~ and contacting said modified aluminum oxy compound(A) with (B) a transition metal compound.

27. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting (A) a modified aluminum oxy compound, obtained by a process that comprises reacting:

an aluminum oxy compound (a) having a ratio of an intensity at 30 ppm(H2) to an intensity at 10 ppm(H1) [H2/H1] in an ^{27}Al-solid NMR spectrum of less than 0.35,

water (b), and

a compound (c) having a hydroxy group, wherein the modified aluminum oxy compound has a ratio of an intensity at 30 ppm(M2) to an intensity at 30 ppm(M1) [M2/M1] in an ^{27}Al-solid NMR spectrum of 0.60 or more,

with (B) a transition metal compound.

28. (Currently amended) A polymerization catalyst obtained by a process that comprises reacting:

an aluminum oxy compound(a') having a ratio of an intensity at 30 ppm(L2) to an intensity at 10 ppm(L1) [L2/L1] in an ^{27}Al-solid NMR spectrum of not less than 0.35, which is obtained by reacting an aluminum oxy compound(a) having a ratio of an intensity at 30 ppm(H2) to an intensity at 10 ppm(H1)[H2/H1] in an ^{27}Al-solid NMR spectrum of less than 0.35 and water (b); and

a compound(c) having a hydroxy group selected from the group consisting of tertiary alcohols and alcohols substituted with a halogen atom, the alcohols substituted with a halogen being selected from alcohols indicated by the formula $CR^1R^2R^3$-OH (wherein each of R^1, R^2 and R^3 independently represents a hydrogen atom or hydrocarbon group having 1 to 20 carbon atoms, which is optionally substituted with a halogen atom, and they may be mutually the same or different), halogenated phenol compounds and silanol compounds, wherein the modified aluminum oxy compound (A) has a ratio of an intensity at 30 ppm(M2) to an intensity at 10 ppm(m1) [M2/M1] in an ^{27}Al-solid NMR spectrum of 0.60 or more, the molar ratio[(a)/(b)] of the aluminum oxy compound(a) to water(b) is 1/3 to 1/0.01, and the molar ratio[(a)/(c)] of the aluminum oxy compound(a) to the compound(c) is 1/3 to 1/0.01 and contacting said aluminum oxy compound (A)

with (B) a transition metal compound.

29. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting (A) a modified aluminum oxy compound, obtained by a process that comprises reacting:

an aluminum oxy compound (a') having a ratio of an intensity at 30 ppm(L2) to an intensity at 10 ppm(L1) [L2/L1] in an ^{27}Al-solid NMR spectrum of not less than 0.35, which is obtained by reacting an aluminum oxy compound (a) having a ratio of an intensity at 30 ppm(H2) to an intensity at 10 ppm (H1) [H2/H1] in an ^{27}Al-solid NMR spectrum of less than 0.35 and water (b); and

a compound (c) having a hydroxy group

and (B) a transition metal compound.

30. (Currently Amended) A polymerization catalyst obtained by a process that comprises reacting:

an aluminum oxy compound(a") having a ratio of an intensity at 30 ppm(N2) to an intensity at 10 ppm(N1) [N2/N1] in an ^{27}Al-solid NMR spectrum of not less than 0.35 obtained by reacting an aluminum oxy compound(a) having a ratio of an intensity at 30 ppm(H2) to an intensity at 10 ppm H1[H2/H1] in its ^{27}Al-solid NMR spectrum of less than 0.35 and a compound(c) having a hydroxy group selected from the group consisting of tertiary alcohols and alcohols substituted with a halogen atom, the alcohol being selected from alcohols indicated by the formula $CR^1R^2R^3$-OH (wherein each of R^1, R^2 and R^3 independently represents a hydrogen atom or hydrocarbon group having 1 to 20 carbon atoms, which is optionally substituted with a halogen atom, and they may be mutually the same or different), halogenated phenol compounds and silanol compounds, with

water(b), wherein the modified aluminum oxy compound (A) has a ratio of an intensity at 30 ppm(M2) to an intensity at 10 ppm(M1)[M2/M1] in an ^{27}Al-solid NMR spectrum of 0.60 or more, the molar ratio[(a)/(b)] of the aluminum oxy compound(a) to water(b) is 1/3 to 1/0.01, and the molar ratio[(a)/(c)] of the aluminum oxy compound(a) to the compound(c) is 1/3 to 1/0.01 ; and

contacting (A) ~~a modified aluminum oxy compound, obtained by a process that comprises reacting:~~

~~an aluminum oxy compound (a") having a ratio of an intensity at 30 ppm (N2) to an intensity at 10 ppm (N1) [N2/N1] in an ^{27}Al-solid NMR spectrum of not less than 0.35 obtained by reacting an aluminum oxy compound (a) having a ratio of an intensity at 30 ppm (L2) to an intensity at 10~~

~~ppm (L1) [L2/L1] in its ^{27}Al solid NMR spectrum of less than 0.35 and a compound (c) having a hydroxy group, and~~

~~water (c)~~

and (B) a transition metal compound.

31. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting either:

(A) the modified aluminum oxy compound of claim 26,

(B) a transition metal compound, and

(C) an organoaluminum compound; or

(A) the modified aluminum oxy compound of claim 26,

(B) a transition metal compound,

(C) an organoaluminum compound, and

(D) any one of (D1) a boron compound represented by the general formula $BQ^1Q^2Q^c$, (D2) a boron compound represented by the general formula $G^+(BQ^1Q^2Q^3Q^4)^-$ and (D3) a boron compound represented by the general formula $(L\text{-}H)^+(BQ^1Q^2Q^3Q^4)^-$, wherein B represents a boron atom in the trivalent valence state: Q^1 to Q^3 may be the same or different and represent a halogen atom, a hydrocarbon group, a halogenated hydrocarbon group, a substituted silyl group, an alkoxy group or a di-substituted amino group; G^+ represents an inorganic or organic cation; and $(L\text{-}H)^+$ represents a Brϕnsted acid.

32. (Currently amended) A polymerization catalyst obtained by a process that comprises contacting either:

(A) the modified aluminum oxy compound of ~~claim~~ claim 27,

(B) a transition metal compound, and

(C) an organoaluminum compound; or

(A) the modified aluminum oxy compound of ~~claim~~ claim 27,

(B) a transition metal compound,

(C) an organoaluminum compound, and

(D) any one of (D1) a boron compound represented by the general formula $BQ^1Q^2Q^3$, (D2) a boron compound represented by the general formula $G^+(BQ^1Q^2Q^3Q^4)^-$ and (D3) a boron compound represented by the general formula $(L\text{-}H)^+(BQ^1Q^2Q^3Q^4)^-$, wherein B represents a boron atom in the trivalent valence state; Q^1 to Q^3 may be the same or different and represent a halogen atom, a hydrocarbon group, a halogenated hydrocarbon group, a substituted silyl group, an alkoxy group or a di-substituted amino group; G^+ represents an inorganic or organic cation: and $(L\text{-}H)^+$ represents a Brϕnsted acid.

33. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting either:

(A) the modified aluminum oxy compound of claim 28,

(B) a transition metal compound, and

(C) an organoaluminum compound; or

(A) the modified aluminum oxy compound of claim 28,

(B) a transition metal compound,

(C) an organoaluminum compound, and

(D) any one of (D1) a boron compound represented by the general formula $BQ^1Q^2Q^3$, (D2) a boron compound represented by the general formula $G^+(BQ^1Q^2Q^3Q^4)^-$ and (D3) a boron compound represented by the general formula $(L\text{-}H)^+(BQ^1Q^2Q^3Q^4)^-$, wherein B represents a boron atom in the trivalent valence state; Q^1 to Q^3 may be the same or different and represent a halogen atom, a hydrocarbon group, a halogenated hydrocarbon group, a substituted silyl group, an alkoxy group or a di-substituted amino group; G^+ represents an inorganic or organic cation; and $(L\text{-}H)^+$ represents a Brϕnsted acid.

34. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting either:

(A) the modified aluminum oxy compound of claim 29,

(B) a transition metal compound, and

(C) an organoaluminum compound; or

(A) the modified aluminum oxy compound of claim 29,

(B) a transition metal compound,

(C) an organoaluminum compound, and

(D) any one of (D1) a boron compound represented by the general formula $BQ^1Q^2Q^3$, (D2) a boron compound represented by the general formula $G^+(BQ^1Q^2Q^3Q^4)^-$ and (D3) a boron compound represented by the general formula $(L\text{-}H)^+(BQ^1Q^2Q^3Q^4)^-$, wherein B represents a boron atom in the trivalent valence state; Q^1 to Q^3 may be the same or different and represent a halogen atom, a hydrocarbon group, a halogenated hydrocarbon group, a substituted silyl group, an alkoxy group or a di-substituted amino group; G^+ represents an inorganic or organic cation; and $(L\text{-}H)^+$ represents a Brϕnsted acid.

35. (Previously presented) A polymerization catalyst obtained by a process that comprises contacting either:

(A) the modified aluminum oxy compound of claim 30,

(B) a transition metal compound, and

(C) an organoaluminum compound; or

(A) the modified aluminum oxy compound of claim 30,

(B) a transition metal compound,

(C) an organaluminum compound, and

(D) any one of (Dl) a boron compound represented by the general formula $BQ^1Q^2Q^3$, (D2) a boron compound represented by the general formula $G^+(BQ^1Q^2Q^3Q^4)^-$ and (D3) a boron compound

represented by the general formula $(L\text{-}H)^+(BQ^1Q^2Q^3Q^4)^-$, wherein B represents a boron atom in the trivalent valence state; Q^1 to Q^3 may be the same or different and represent a halogen atom, a hydrocarbon group, a halogenated hydrocarbon group, a substituted silyl group, an alkoxy group or a di-substituted amino group; G^+ represents an inorganic or organic cation; and $(L\text{-}H)^+$ represents a Brϕnsted acid.

36. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 26.

37. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 27.

38. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 28.

39. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 29.

40. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 30.

41. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 31.

42. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 32.

43. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 33.

44. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 34.

45. (Original) A process for producing an olefin polymer, which comprises homopolymerizing an olefin or copolymerizing olefins with the polymerization catalyst of claim 35.

46. (Original) A process for producing an olefin polymer according to claim 36, wherein said olefin polymer is a copolymer of ethylene and α-olefin having 3 to 20 carbon atoms.

47. (Original) A process for producing an olefin polymer according to claim 37, wherein said olefin polymer is a copolymer of ethylene and α-olefin having 3 to 20 carbon atoms.

48. (Original) A process for producing an olefin polymer according to claim 38, wherein said olefin polymer is a copolymer of ethylene and α-olefin having 3 to 20 carbon atoms.

49. (Original) A process for producing an olefin polymer according to claim 39, wherein said olefin polymer is a copolymer of ethylene and α-olefin having 3 to 20 carbon atoms.

50. (Original) A process for producing an olefin polymer according to claim 40, wherein said olefin polymer is a copolymer of ethylene and α-olefin having 3 to 30 carbon atoms.

51. (Original) A process for producing an olefin polymer according to claim 36, wherein said olefin polymer is a homopolymer of 1-butene.

52. (Original) A process for producing an olefin polymer according to claim 37, wherein said olefin polymer is a homopolymer of 1-butene.

53. (Original) A process for producing an olefin polymer according to claim 38, wherein said olefin polymer is a homopolymer of 1-butene.

54. (Original) A process for producing an olefin polymer according to claim 39, wherein said olefin polymer is a homopolymer of 1-butene.

55. (Original) A process for producing an olefin polymer according to claim 40, wherein said olefin polymer is a homopolymer of 1-butene.

56. (Original) A process for producing an alkenyl aromatic hydrocarbon polymer, which comprises homopolymerizing an alkenyl aromatic hydrocarbon or copolymerizing at least one alkenyl aromatic hydrocarbon and at least one olefin with the polymerization catalyst of claim 26.

57. (Original) A process for producing an alkenyl aromatic hydrocarbon polymer, which comprises homopolymerizing an alkenyl aromatic hydrocarbon or copolymerizing at least one alkenyl aromatic hydrocarbon and at least one olefin with the polymerization catalyst of claim 27.

58. (Original) A process for producing an alkenyl aromatic hydrocarbon polymer, which comprises homopolymerizing an alkenyl aromatic hydrocarbon or copolymerizing at least one alkenyl aromatic hydrocarbon and at least one olefin with the polymerization catalyst of claim 28.

59. (Original) A process for producing an alkenyl aromatic hydrocarbon polymer, which comprises homopolymerizing an alkenyl aromatic hydrocarbon or copolymerizing at least one alkenyl aromatic hydrocarbon and at least one olefin with the polymerization catalyst of claim 29.

60. (Original) A process for producing an alkenyl aromatic hydrocarbon polymer, which comprises homopolymerizing an alkenyl aromatic hydrocarbon or copolymerizing at least one alkenyl aromatic hydrocarbon and at least one olefin with the polymerization catalyst of claim 30.

61. (Original) A copolymer of at least one alkenyl aromatic hydrocarbon and at least one olefin, having a number average molecular weight of 700,000 or more and a molecular weight distribution in terms of a ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn), of 1.85 to 2.5.

62. (Original) An α-olefin polymerization catalyst according to claim 26, wherein the transition metal compound (B) is a transition metal compound having a capability of stereoregular polymerization of an α-olefin.

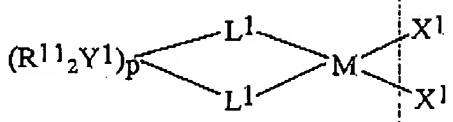
63. (Original) An α-olefin polymerization catalyst according to claim 27, wherein the transition metal compound (B) is a transition metal compound having a capability of stereoregular polymerization of an α-olefin.

64. (Original) An α-olefin polymerization catalyst according to claim 28, wherein the transition metal compound (B) is a transition metal compound having a capability of stereoregular polymerization of an α-olefin.

65. (Original) An α-olefin polymerization catalyst according to claim 29, wherein the transition metal compound (B) is a transition metal compound having a capability of stereoregular polymerization of an α-olefin.

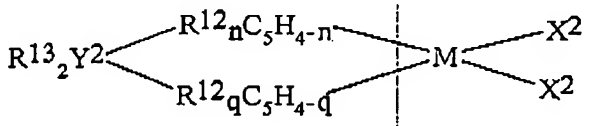
66. (Original) An α-olefin polymerization catalyst according to claim 30, wherein the transition metal compound (B) is a transition metal compound having a capability of stereoregular polymerization of an α-olefin.

67. (Previously presented) An α-olefin polymerization catalyst according to claim 62, wherein the transition metal compound having a capability of stereoregular polymerization of an α-olefin is a transition metal compound (b1) represented by the general formula (4) or (5) below:



(4)

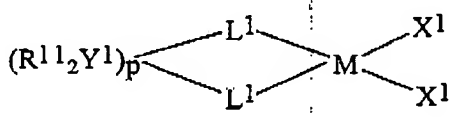
(wherein M is a transition metal atom of the Group IV of the Periodic Table, L^1 is an η^5-indenyl group or a substituted η^5-indenyl group, and two L^1's may be mutually the same or different; Y^1 is a carbon atom, a silicon atom, a germanium atom or a tin atom, each of R^{11} and X^1 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{11} and X^1 may be the same or different mutually, P is 1 or 2); or



(5)

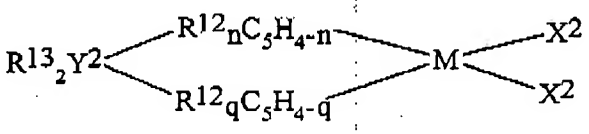
(wherein M is a transition metal atom of the Group IV of the Periodic Table, Y^2 is a silicon atom, a germanium atom or a tin atom, each of (R^{12}_n-C_5H_{4-n}) and R^{12}_q-C_5H_{4-q}) is a substituted η^5-cyclopentadienyl group, and each of n and q is an integer of 1 to 3; the respective R^{12} may be mutually the same or different, and indicate a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group.; the position and/or kind of R^{12} in the substituted η^5-cyclopentadienyl group is selected so that a symmetric plane including M does not exist; each of R^{13} and X^2 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{13} and X^2 may be the same or different mutually).

68. (Original) An α-olefin polymerization catalyst according to claim 63, wherein the transition metal compound having a capability of stereoregular polymerization of an α-olefin is a transition metal compound (b1) represented by the general formula (4) or (5) below:



(4)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, L^1 is an η^5-indenyl group or a substituted η^5-idenyl group, and two L^1's may be mutually the same or different; Y^1 is a carbon atom, a silicon atom, a germanium atom or a tin atom, each of R^{11} and X^1 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{11} and X^1 may be the same or different mutually, P is 1 or 2); or

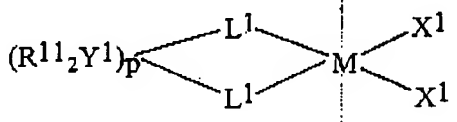


(5)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, Y^2 is a silicon atom, a germanium atom or a tin atom, each of $(R^{12}_n\text{-}C_5H_{4-n})$ and $(R^{12}_q\text{-}C_5H_{4-q})$ is a substituted η^5-cyclopentadienyl group, and each of n and q is an integer of 1 to 3, the respective R^{12} may be mutually the same or different, and indicate a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group; the position and/or kind of R^{12} in the substituted η^5-cyclopentadienyl group is selected so that a symmetric plane including M does not exist; each of R^{13} and X^2 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an

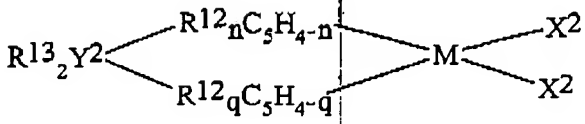
alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{13} and X^2 may be the same or different mutually).

69. (Original) An α-olefin polymerization catalyst according to claim 64, wherein the transition metal compound having a capability of stereoregular polymerization of an α-olefin is a transition metal compound (b1) represented by the general formula (4) or (5) below:



(4)

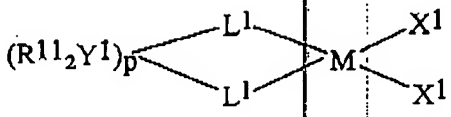
(wherein M is a transition metal atom of the Group IV of the Periodic Table, L^1 is an η^5-indenyl group or a substituted η^5-indenyl group, and two L^1's may be mutually the same or different; Y^1 is a carbon atom, a silicon atom, a germanium atom or a tin atom, each of R^{11} and X^1 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{11} and X^1 may be the same or different mutually, P is 1 or 2); or



(5)

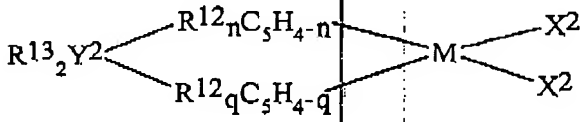
(wherein M is a transition metal atom of the Group IV of the Periodic Table, Y^2 is a silicon atom, a germanium atom or a tin atom, each of $(R^{12}{}_n\text{-}C_5H_{4-n})$ and $(R^{12}{}_q\text{-}C_5H_{4-q})$ is a substituted η^5-cyclopentadienyl group, and each of n and q is an integer of 1 to 3, the respective R^{12} may be mutually the same or different, and indicate a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, the position and/or kind of R^{12} in the substituted η^5-cyclopentadienyl group is selected so that a symmetric plane including M does not exist; each of R^{13} and X^2 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{13} and X^2 may be the same or different mutually).

70. (Original) An α-olefin polymerization catalyst according to claim 65, wherein the transition metal compound having a capability of stereoregular polymerization of an α-olefin is a transition metal compound (b1) represented by the general formula (4) or (5) below:



(4)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, L^1 is an η^5-indenyl group or a substituted η^5-indenyl group, and two L^1's may be mutually the same or different; Y^1 is a carbon atom, a silicon atom, a germanium atom or a tin atom, each of R^{11} and X^1 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{11} and X^1 may be the same or different mutually, P is 1 or 2); or

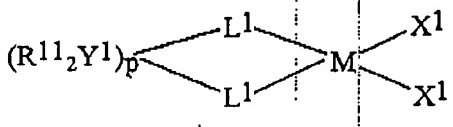


(5)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, Y^2 is a silicon atom, a germanium atom or a tin atom, each of $(R^{12}_n\text{-}C_5H_{4-n})$ and $(R^{12}_q\text{-}C_5H_{4-q})$ is a substituted η^5-cyclopentadienyl group, and each of n and q is an integer of 1 to 3, the respective R^{12} may be mutually the same or different, and indicate a halogen atom, an alkyl group, an aralkyl group, an aryl

group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group; the position and/or kind of R^{12} in the substituted η^5-cyclopentadienyl group is selected so that a symmetric plane including M does not exist; each of R^{13} and X^2 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{13} and X^2 may be the same or different mutually).

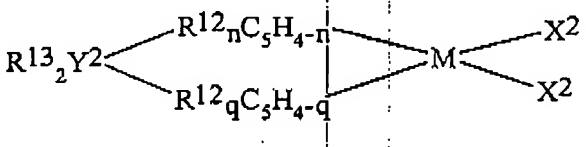
71. (Original) An α-olefin polymerization catalyst according to claim 66, wherein the transition metal compound having a capability of stereoregular polymerization of an α-olefin is a transition metal compound (b1) represented by the general formula (4) or (5) below:



(4)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, L^1 is an η^5-indenyl group or a substituted η^5-indenyl group, and two L^1's may be mutually the same or different; Y^1

is a carbon atom, a silicon atom, a germanium atom or a tin atom, each of R^{11} and X^1 is a hydrogen atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{11} and X^1 may be the same or different mutually, P is 1 or 2); or



(5)

(wherein M is a transition metal atom of the Group IV of the Periodic Table, Y^2 is a silicon atom, a germanium atom or a tin atom, each of $(R^{12}{}_n\text{-}C_5\text{-}H_{4-n})$ and $(R^{12}{}_q\text{-}C_5H_{4-q})$ is a substituted η^5-cyclopentadienyl group, and each of n and q is an integer of 1 to 3; the respective R^{12} may be mutually the same or different, and indicate a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group; the position and/or kind of R^{12} in the substituted η^5-cyclopentadienyl group is selected so that a symmetric plane including M does not exist; each of R^{13} and X^2 is a hydrogen

atom, a halogen atom, an alkyl group, an aralkyl group, an aryl group, a substituted silyl group, an alkoxy group, an aralkyloxy group, an aryloxy group or a heterocyclic group, and all of R^{13} and X^2 may be the same or different mutually).

72. (Original) A process for producing an α-olefin polymer, which comprises polymerizing an α-olefin with the α-olefin polymerization catalyst of claim 62.

73. (Original) A process for producing an α-olefin polymer, which comprises polymerizing an α-olefin with the α-olefin polymerization catalyst of claim 63.

74. (Original) A process for producing an α-olefin polymer, which comprises polymerizing an α-olefin with the α-olefin polymerization catalyst of claim 64.

75. (Original) A process for producing an α-olefin polymer, which comprises polymerizing an α-olefin with the α-olefin polymerization catalyst of claim 65.

76. (Original) A process for producing an α-olefin polymer, which comprises polymerizing an α-olefin with the α-olefin polymerization catalyst of claim 66.

77. (Original) The process for producing an α-olefin polymer according to claim 72, wherein the α-olefin polymer is an isotactic propylene polymer.

78. (Original) The process for producing an α-olefin polymer according to claim 73, wherein the α-olefin polymer is an isotactic propylene polymer.

79. (Original) The process for producing an α-olefin polymer according to claim 74, wherein the α-olefin polymer is an isotactic propylene polymer.

80. (Original) The process for producing an α-olefin polymer according to claim 75, wherein the α-olefin polymer is an isotactic propylene polymer.

81. (Original) The process for producing an α-olefin polymer according to claim 76, wherein the α-olefin polymer is an isotactic propylene polymer.